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The Significance of Attachment Representations for Quality of Life One Year Following Gastric Bypass Surgery: A Longitudinal Analysis

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Background: Quality of life after bariatric surgery may, among other things, depend on patients' attachment representations such as anxiety about rejection and abandonment (attachment anxiety) and avoidance of intimacy and interdependence (attachment avoidance). The aim of this study was to examine whether attachment representations, independent of body mass index (BMI), are associated with the level and course of physical functioning and mental well-being after gastric bypass surgery.

Method: A total of 131 patients applying for a Roux-en-Y gastric bypass operation agreed to participate in this longitudinal study. Patients' attachment representations (ECR-R) were measured before surgery, and quality of life dimensions (physical functioning and mental well-being, SF-36) were measured before surgery and 1, 3, 6, and 12 months following surgery. Linear mixed effect models were used in analyses.

Results: Physical functioning ($p < 0.001$) improved, and mental well-being worsened ($p = 0.002$) in the postoperative interval. Both attachment anxiety ($p = 0.005$) and attachment avoidance ($p < 0.001$) were associated with a lower level of mental well-being, but not with the postoperative course of quality of life.

Conclusions: Our study suggests that bariatric surgery leads to improvement in physical functioning but not mental well-being. Results highlight that patients with insecure attachment representations should be protected against unrealistic expectations regarding improvement of mental well-being after surgery.

Introduction

GASTRIC BYPASS SURGERY is the weight loss treatment of choice for obese individuals with a body mass index (BMI) of more than 35 kg/m² in the presence of weight-related comorbidities.¹ Several studies indicated improvement in quality of life following gastric bypass surgery,^{2–4} while other studies did not find improvement.^{5,6} In the present study, we propose that improvement in quality of life after bariatric surgery may, in addition to the amount of weight loss, depend on individual difference characteristics⁵ such as one's attachment representations.

Attachment theory describes the significance of attachment representations, that is, the enduring beliefs and expectations about the availability and responsiveness about the self (e.g., as worthy of love and care) and about others (e.g., as trustworthy and caring).⁶ In adulthood, these beliefs and expectations are conceptualized as a set of mental states concerning *anxiety* about rejection and abandonment, and

avoidance of intimacy and interdependence.^{11–13} Patients high on attachment anxiety have a sense of vulnerability and hypervigilance for threats, resulting in high levels of perceived stress and distress.⁷ Despite their strong desire for closeness and reassurance, research shows that support is hardly effective in reducing distress in these people.⁸ In contrast, patients high on attachment avoidance feel uncomfortable in close relationships, perceive others as unavailable and unable to provide adequate support when needed, and therefore value independency and self-reliance.^{9,10} The importance of attachment theory is supported by the finding that both attachment anxiety and attachment avoidance have been found to be associated with impaired quality of life in healthy people,^{11,12} chronically ill patients,¹³ and in patients seeking bariatric surgery.¹⁴ A cross-sectional study in patients seeking bariatric surgery showed that both attachment anxiety and attachment avoidance were associated with less positive evaluations on patients' suitability for bariatric surgery by the specialized psychologists.¹⁵ Furthermore, attachment anxiety

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has been found to be associated with mental healthcare utilization in patients seeking bariatric surgery.¹⁶ In addition, in a study by Sockalingam *et al.*, an association between attachment avoidance and poor mental health quality of life was observed.¹⁷ It is as yet unknown whether attachment representations might impact the postoperative level and course of quality of life. Quality of life takes into account patients' physical functioning and mental well-being, which are the main elements of health.

The aim of the present longitudinal study was to investigate whether attachment anxiety and attachment avoidance, independent of the course of BMI, are associated with the level and course of physical functioning and mental well-being in the first year after a gastric bypass operation.

Methods

Study sample

Included in analyses were 105 patients with morbid obesity between 18 and 60 years of age who had undergone a Roux-en-Y gastric bypass operation in Slotervaart hospital, Amsterdam, between February and August 2012. The flow chart is presented in Figure 1. Of the 310 patients who applied for bariatric screening, 190 were operated on between April and December 2012, and 131 of these patients agreed to participate in this study. Eventually, 105 patients completed the study, and 26 were lost to follow-up.

Procedures

All patients referred to the Slotervaart bariatric surgery clinic received presurgical multidisciplinary assessment by a dietician, internist, surgeon, and a psychologist, including self-report questionnaires, semi-structured interviews, and assessments of body weight and height (BMI), preoperative diet and exercise habits, comorbidity, and sociodemographics.

For this study, questionnaires were added to the standard set of preoperative measures assessing patients' attachment representations preoperatively and quality of life both pre- and postoperatively. The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Medical Ethical Committee of the Slotervaart Hospital. Informed consent was obtained from all participants.

Instruments

Quality of life was measured using the SF-36.¹⁸ The physical component summary (as a reflection of physical functioning) and mental component summary (as a reflection of mental well-being) of the SF-36 were used as outcome variables in the present study.¹⁹ The validity of the Dutch version of SF-36 has been tested and has good construct validity, high internal consistency, and high test-retest stability; norm data were obtained from the Dutch Health Survey in community and chronic disease populations.²⁰

Adult attachment was assessed using the Experiences in Close Relationships—Revised Scale (ECR-R). The ECR-R is a 36-item self-report measure of adult attachment, which requires participants to reflect on their typical ways of relating in close/romantic relationships. Reviews of self-report measures of adult attachment suggest that the ECR-R has the best psychometric properties of the available measures.²¹ The ECR consists of two continuous subscales: attachment anxiety (e.g., "I'm afraid that I will lose my partner's love") and attachment avoidance (e.g., "I prefer not to show a partner how I feel deep down"). Both dimensions are assessed with 18 items. Answers are on a 5-point scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." In the present study, the Cronbach's alpha for subscale attachment anxiety was 0.88, and for the subscale attachment avoidance, it was 0.90.

Body weight and height as well as medical variables (e.g., hypertension, diabetes) were acquired from patients' medical

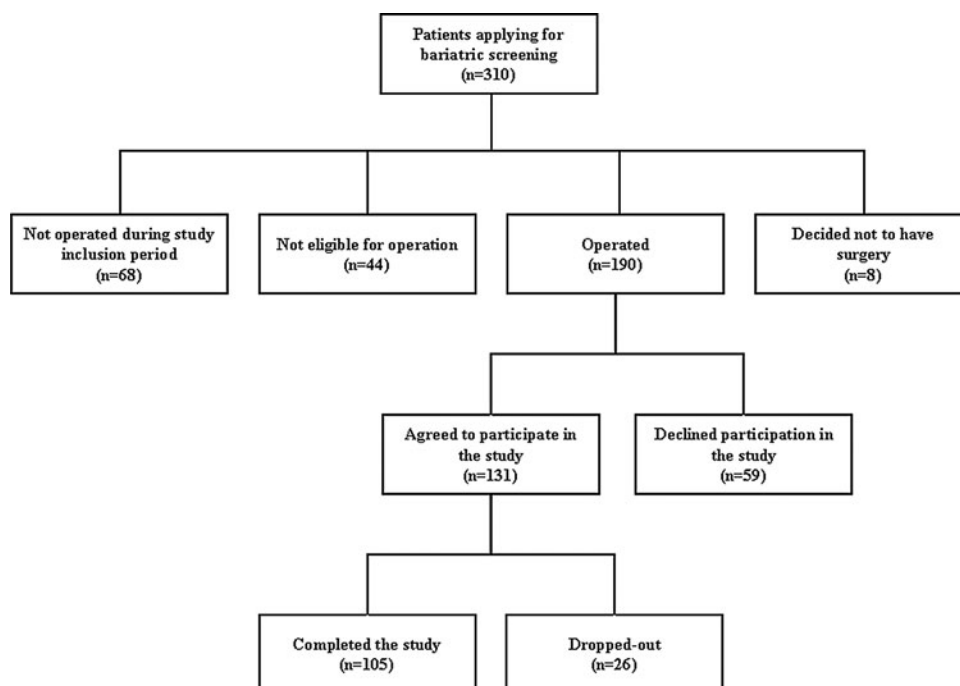


FIG. 1. Flow chart.

records. Demographic variables (e.g., age, gender, marital status) at the first assessment were self-reported by the patients.

Statistical analyses

Continuous variables are presented as means and standard deviations, and categorical data as frequencies and percentages. Assumptions of normality were checked for the dependent variables. The score distributions of the quality of life dimensions were sufficiently normal to allow parametric tests. Missing items in psychometric rating scales were substituted by the individual respondent's mean score on the respective scales, when missing items did not constitute more than half of the answered items.²²

To examine which variables should be included as covariates in further analyses, independent samples *t*-tests and Pearson correlations were used to test the associations between demographic variables (i.e., age, gender, marital status, level of education) and medical variables (i.e., hypertension, diabetes, osteoarthritis, sleep apnoea, type of operation) on the one hand and the outcome variables (i.e., physical functioning and mental well-being) at baseline on the other hand.

Linear mixed model analyses were used to examine whether the level and course of physical functioning and mental well-being after the gastric bypass operation were predicted by preoperative levels of attachment anxiety and attachment avoidance. Maximum likelihood estimation was selected, and a random intercept was added to all models to take account of and maintain individual differences in baseline values. Three models were specified and tested separately for both domains of quality of life.

In Model 1, linear mixed models examined the effect of time, that is, the change in outcome measurements across baseline and the 1, 3, 6, and 12-month follow-ups after surgery. Besides time, no other variables were added to this model.

Model 2 tested the main effect of attachment scores, that is, whether attachment anxiety and attachment avoidance were associated with levels of physical functioning and mental well-being. In this model, covariates that correlated with the dependent variable and the level of BMI over time were included to adjust for these variables.

Since previous studies have shown that the course of BMI is associated with the course of quality of life, we included the interaction term of BMI by time reflecting the course of BMI in model 3.²⁰ In this way, we adjusted for the course of BMI. Moreover, covariates that correlated with the dependent variable were included in the model to adjust for these variables. Thus, model 3 tested whether attachment anxiety and attachment avoidance were associated with the course of quality of life across the repeated measurements. This was done by predicting the quality of life dimension from the interaction term of the attachment dimension by time. Significant interactions were probed by plotting regression lines for individuals with low (-1 SD) and high ($+1$ SD) levels on the two interaction terms while filling out mean values for all the other variables.²³

All analyses were performed with SPSS Statistics for Windows v19.0 (IBM Corp., Armonk, NY). The level of significance was set at $p < 0.05$. All tests were two-tailed.

Results

Independent samples *t*-tests showed that patients who dropped out ($n = 26$) and those who completed the study differed on attachment anxiety ($t(124) = -11.80$ ($p < 0.001$), [95% CI $-2.34, -1.66$], and attachment avoidance ($t(126) = -3.14$ ($p = 0.002$), [95% CI $-0.83, -1.19$]. That is, more anxiously and more avoidantly attached patients refused to complete questionnaires during the follow-up of the study. Drop-outs did not differ significantly on any other variables in this study.

Our study sample included 105 patients, who were predominantly female (81%) and had a mean age of 45 ± 9.1 years. Most patients lived with a partner (84%), and about a quarter of the sample (27%) had received a high level of education (bachelors' degree or higher). The majority of patients were employed (76%). Before the operation, the mean weight was 123.7 ± 19.7 kg, and the mean BMI was 42.8 ± 6.1 kg/m². Most of the patients had gastric bypass surgery for the first time (86%), and 14% of the patients had a redo surgery (gastric bypass and removal of gastric band).

Table 1 shows the correlations between the main study variables. An independent samples *t*-test showed that being a woman, $t(99) = -3.27$ ($p = 0.001$), [95% CI $-12.33, -3.02$]; not having diabetes, $t(99) = 3.15$ ($p = 0.002$), [95% CI $2.29, 10.11$]; having osteoarthritis, $t(99) = -5.486$ ($p < 0.001$), [95% CI $-13.18, -6.18$]; and not having a partner, $t(99) = -2.02$ ($p = .046$), [95% CI $-8.84, -0.07$] were associated with poorer physical functioning. Furthermore, having a lower education level, $t(98) = -2.39$ ($p = 0.02$), [95% CI $-7.36, -0.69$], and not having a partner, $t(99) = -2.12$ ($p = 0.04$), [95% CI $-7.50, -0.25$], were associated with poorer mental well-being. Thus, in models 2 and 3, tests of physical functioning included the covariates gender, diabetes, osteoarthritis, and marital status, and tests of mental well-being included the covariates education level and marital status.

Table 2 shows the means and standard deviations of the attachment variables, quality of life dimensions, and BMI at the repeated assessments.

Figure 2 shows the mean scores of the quality of life dimensions over time. Model 1 of the linear mixed model analyses showed that physical functioning improved across the five repeated measurements ($F = 128.6$, $p < 0.001$), while mental well-being worsened between baseline and 1 month ($p < 0.001$) and between baseline and 1 year after surgery ($F = 4.28$, $p = 0.01$). The postoperative levels of physical functioning and mental well-being after surgery were close to the norm of 50 seen in the general population.²⁰

Model 2 examined whether baseline assessments of attachment anxiety and attachment avoidance, controlled for covariates and the main effect of the level BMI over time,

TABLE 1. PEARSON CORRELATIONS BETWEEN THE FIVE MAIN VARIABLES IN THE STUDY

	1	2	3	4
1. Attachment anxiety				
2. Attachment avoidance	.49**			
3. Physical functioning	-.13	-.07		
4. Mental well-being	-.42**	-.42**	-.05	
5. BMI	.05	.00	-.21*	.06

* $p < .05$, ** $p < .01$

BMI, body mass index.

TABLE 2. MEANS AND STANDARD DEVIATIONS OF THE ATTACHMENT VARIABLES, QUALITY OF LIFE DIMENSIONS, AND BMI AT THE REPEATED ASSESSMENTS

	Baseline <i>M (SD)</i>	1 month After <i>M (SD)</i>	3 months After <i>M (SD)</i>	6 months After <i>M (SD)</i>	1 year After <i>M (SD)</i>
Attachment anxiety	1.9 (.7)	—	—	—	—
Attachment avoidance	2.1 (.76)	—	—	—	—
Physical functioning	37.6 (9.5)	46.1 (8.3)	51.6 (8.4)	53.2 (7.6)	54.6 (7.1)
Mental well-being	51.9 (7.8)	48.3 (8.7)	50.8 (8.9)	50.9 (8.7)	49.7 (9.3)
BMI	42.8 (6.1)	38.0 (5.6)	34.8 (5.1)	33.5 (5.4)	30.1 (4.7)

SD, standard deviation.

were associated with the level of quality of life across repeated measurements. The level of BMI over time was associated with the level of physical functioning ($F = 14.43$, $p < 0.001$) but not with the level of mental well-being ($F = 0.22$, $p = 0.639$). Both attachment anxiety ($F = 8.34$, $p = 0.005$) and attachment avoidance ($F = 13.74$, $p < 0.001$) were associated with the level of mental well-being, but neither attachment anxiety ($F = 0.38$, $p = 0.537$) nor attachment avoidance ($F = 0.46$, $p = 0.498$) were associated with the level of physical functioning. Regarding the relation between attachment representations and mental well-being, for each unit a patient scored higher on attachment anxiety, the average level of mental well-being across repeated measurements was 2.5 units lower [95% CI -4.27, 0.81]. Moreover, for each unit a patient scored higher on attachment avoidance, the average level of mental well-being across repeated measurements was 3.3 units lower [95% CI -5.05, -1.53].

Model 3 examined whether attachment representations were associated with the course of the quality of life dimensions by testing the interaction between the attachment representations and the repeated measurements at the quality of life dimensions. Analyses showed that attachment representations were not associated with the course of physical functioning or mental well-being. However, we did find that the postoperative course of physical functioning was predicted by the interaction be-

tween BMI and time ($F = 16.34$, $p < 0.001$). The interaction is shown in Figure 3. As compared to patients with a lower mean BMI (-1 SD in this sample), patients with a high mean BMI (+1 SD in this sample) improved toward a similar level of physical functioning 1 year after the operation, despite their clearly lower level of physical functioning before the operation.

Discussion

This study showed significant improvement in physical functioning but not in mental well-being within the first year after a gastric bypass operation. Both attachment anxiety and attachment avoidance were associated with a lower level of postoperative mental well-being. We did not find an association between attachment anxiety and attachment avoidance

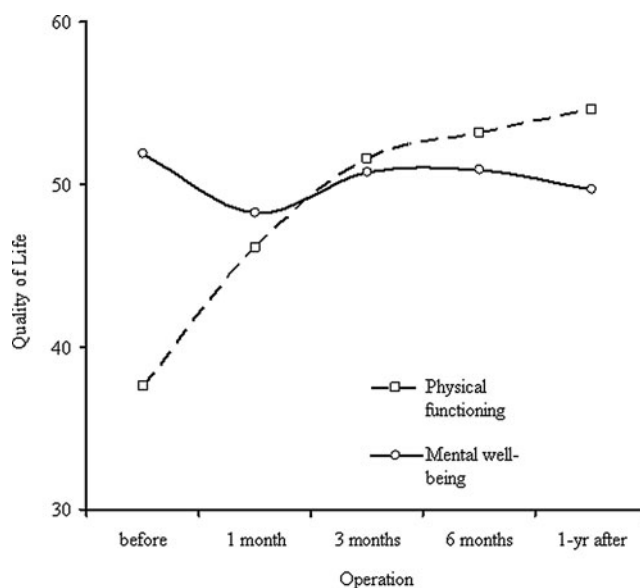


FIG. 2. Mean scores of the quality of life dimensions, physical functioning, and mental well-being before gastric bypass surgery and 1, 3, 6, and 12 months following surgery.

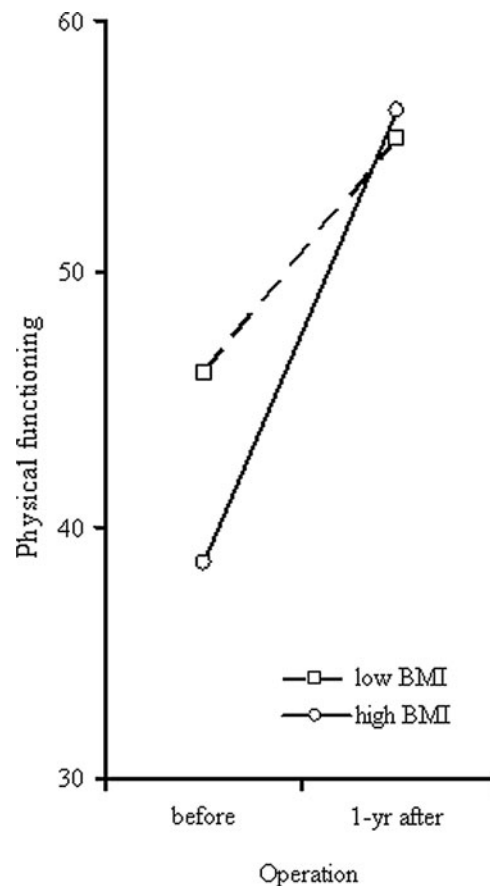


FIG. 3. Physical functioning as predicted from having a low versus high average body mass index (BMI) and time of measurement (before vs. 1 year after the operation).

and the postoperative level of physical functioning. Also no association was found between attachment representations and the postoperative course of physical functioning and mental well-being.

The finding that patients benefit more in terms of physical functioning than mental well-being is in accordance with previous studies.^{24,25} Mental well-being seems to be a rather constant factor that is not easily influenced by weight reduction. As shown in a meta-analysis, physical functioning deviates far more from normal in bariatric surgery candidates than mental well-being, and the level of mental well-being is hardly dependent on body weight.²⁶ In line with the results of this meta-analysis, our study showed that a loss of body weight was associated with an improvement of physical functioning. However, the present study extends these results by indicating that to improve mental well-being, a focus on processes related to attachment representations may be more important than a reduction of body weight. That is, insecurely attached patients reported lower levels of mental well-being before bariatric surgery and remained more dissatisfied after bariatric surgery than more securely attached patients.

The prospective design is an asset of this study, but a weaker point is that the study might be biased toward patients with relatively good attachment representations because patients with poorer attachment representations dropped out. In future studies, it would be interesting to investigate which individuals do improve substantially in terms of mental well-being. In addition, future studies should examine the significance of attachment representations for quality of life in the longer term, as adult attachment may be helpful in the selection of patients for surgery and the guidance of patients after surgery.

In summary, we found significant improvements in physical functioning—but not mental well-being—1 year following gastric bypass surgery. While weight and weight loss are predictors of physical functioning, attachment representations predict levels of mental well-being.

In order to improve mental well-being in insecurely attached patients with morbid obesity, other strategies than weight reduction should be considered. A recent review provides preliminary evidence that psychotherapy may be effective in promoting well-being in insecurely attached patients by reframing and reappraising past interpersonal experiences.²⁷ Also, rather than changing attachment representations, which may be an intensive and time-consuming task, attachment tailored care by healthcare workers may also promote well-being and prevent an unnecessary increase in distress and turmoil.⁷ All patients, especially those with insecure attachment representations, should be protected against unrealistic expectations of improvement in mental well-being after surgery.

Author Disclosure Statement

No competing financial interests exist.

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